# Lab 3
## Expressions and design

*12 September 2019*

The drill for this lab is given below. Come to lab on Thursday either with it completed or with a specific written question in your notebook identifying which drill step you got to and what about it you're stuck on.

## Tinkerblock drill

Make a directory for this lab. In your directory for this lab, you'll start the early part of the design process, and move towards building a working program.

To recap: I'm running a Tinkerblock factory; the Tinkerblock connectors are long sticks of wood with square cross-sections (the fancy term for this is a right rectangular prism, but you don't need to know that). My core question, which this program should answer, is what is the total surface area of one run of these sticks? We decided in class that we would need three inputs (the width of the square cross-section, the length of the piece, and the number of pieces).

1. In the README.txt file (or in your notebook, but it will eventually go in the readme file), write down at least a brief summary of the problem statement.

2. In your notebook, work out at least two test cases for the problem. Use actual numbers that are real-ish (if you measure in millimetres they could all be integers :). At this stage all your computation can be with the actual numbers of your test cases.

3. In your notebook, write out using generic variable names the computations you just did when you "did it by hand". Pick good names for the nameable intermediate values. This is your pseudocode.

4. Put your test cases into `.in` and `.expect` files and write a `.cpp` file with the boilerplate stuff (`#include`, `main`, etc), and check that it compiles and runs before you start adding more.

5. Add the pseudocode to your `.cpp` file piece by piece, writing code to read in data, compute the required values according to your algorithm, and print a result. Try to compile and test your code after every meaningful chunk that you add.